

The melting point of a solid, the temperature at which it transitions to liquid at atmospheric pressure, is a useful physical constant for identification. Strong intermolecular forces in a solid lead to high melting points, while weak forces result in low melting points. Pure solids melt sharply within a 1–2°C range, while impurities lower and broaden this range. Insoluble impurities don't affect the melting point. Mixture melting points help identify unknown compounds; if a mixture of two compounds melts sharply at the same temperature as each individual compound, they are identical. Otherwise, the mixture's melting point will be lower and its range broader. Melting point determination involves heating a sample in a capillary tube immersed in an oil bath, noting the temperature range of melting. Factors affecting accuracy include particle size, amount of sample, and heating rate, with the latter being most critical. The experiment aims to determine melting points of pure and impure solids and identify an unknown substance using its melting point.